

CLAIMS

- 1 1. A downhole releasable coupling, the coupling
- 2 comprising a first substantially tubular member having
- 3 a bore therethrough, a first screw thread around an
- 4 outer surface thereof, one or more raised portions
- 5 arranged circumferentially on the outer surface, the
- 6 raised portions defining a first face surrounding the
- 7 member and substantially perpendicular to the outer
- 8 surface, the first face being directed toward the
- 9 first screw thread, the first face having a plurality
- 10 of first projections, each first projection having a
- 11 substantially first straight portion arranged parallel
- 12 to the bore and a first sloping portion, joining an
- 13 apex of the first projection to a base of an adjacent
- 14 projection; and a second tubular member having a bore
- 15 therethrough, a second screw thread around an inner
- 16 surface thereof, one or more raised portions arranged
- 17 circumferentially on an outer surface thereof, the
- 18 raised portions defining a second face surrounding the
- 19 member and substantially perpendicular to the outer
- 20 surface, the second face being at an end of the
- 21 member, the second face having a plurality of second
- 22 projections, each second projection having a
- 23 substantially second straight portion arranged
- 24 parallel to the bore and a second sloping portion,
- 25 joining an apex of the second projection to a base of
- 26 an adjacent projection; wherein the first tubular
- 27 member slides within the second tubular member, the
- 28 first and second screw threads mate and on part
- 29 engagement of the screw threads, the first and second
- 30 straight portions can meet to thereby transfer torque
- 31 when a member is rotated in the direction of the screw
- 32 threads.

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- 3 2. A downhole releasable coupling as claimed in Claim 1
- 4 wherein the screw threads are right hand screw
- 5 threads.
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- 7 3. A downhole releasable coupling as claimed in Claim 1
- 8 or Claim 2 wherein the screw threads are multiple
- 9 start threads.
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- 11 4. A downhole releasable coupling as claimed in any
- 12 preceding Claim wherein the screw threads are double
- 13 start screw threads.
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- 15 5. A downhole releasable coupling as claimed in any
- 16 preceding Claims wherein the screw threads are square.
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- 18 6. A downhole releasable coupling as claimed in any
- 19 preceding Claim wherein the screw threads have generous
- 20 lead in edges so that the coupling can be re-engaged
- 21 easily.
- 22
- 23 7. A downhole releasable coupling as claimed in any
- 24 preceding Claim wherein the tubular members are
- 25 initially releasably attached to each other by
- 26 shearable means.
- 27
- 28 8. A downhole releasable coupling as claimed in Claim 7
- 29 wherein the shearable means is one or more shear pins
- 30 arranged through apertures on the second member and
- 31 resting in pockets in the outer surface of the first
- 32 member.
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- 1 9. A downhole releasable coupling as claimed in Claim 8
2 wherein the apertures and the pockets align when the
3 first and second straight portions abut.
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- 5 10. A downhole releasable coupling as claimed in any
6 preceding Claim wherein at least one o-ring is
7 arranged at either end of the screw thread
8 circumferentially around the tubular member.
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- 10 11. A downhole releasable coupling as claimed in any
11 preceding Claim wherein the coupling comprises four
12 raised portions on each tubular member; each face
13 providing two equidistantly spaced projections; four
14 apertures being arranged through the raised portions
15 of the second tubular; shear pins being located
16 through each aperture into four pockets on the outer
17 surface of the first tubular; and an o-ring located
18 into a groove at each end of the screw thread of the
19 first tubular member.
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- 21 12. A drilling liner system comprising a running tool
22 having a substantially cylindrical first body and a
23 first bore therethrough, the first body having an end
24 adapted for connection to a drill string, and a
25 setting sleeve having a substantially cylindrical
26 second body and a second bore therethrough, the second
27 body having an end adapted for connection to a liner,
28 wherein the running tool and the setting sleeve couple
29 via a detachable coupling according to any one of
30 Claims 1 to 11.
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- 32 13. A drilling liner system as claimed in Claim 12
33 wherein the running tool includes the first tubular

- 1 and the setting sleeve includes the second tubular
2 member.
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- 4 14. A drilling liner system as claimed in Claim 12 or
5 Claim 13 wherein the bores align to provide a
6 continuous central bore through the system.
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- 8 15. A drilling liner system as claimed in any one of
9 Claims 12 to 14 wherein the screw threads are right
10 hand screw threads.
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- 12 16. A drilling liner system as claimed in any one of
13 Claims 12 to 15 wherein the running tool includes one
14 or more first radial outlets arranged
15 circumferentially around the first body, the setting
16 sleeve includes one or more second radial outlets
17 arranged circumferentially around the second body, and
18 in a first position the first and second radial
19 outlets are aligned and fluid can pass radially from
20 the system.
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- 22 17. A drilling liner system as claimed in Claim 16
23 wherein there are four radial outlets in each body.
24
- 25 18. A drilling liner system as claimed in Claim 16 or
26 Claim 17 wherein the first position occurs when the
27 first and second screw threads are partially engaged.
28
- 29 19. A drilling liner system as claimed in any one of
30 Claims 12 to 18 wherein the system further comprises a
31 seal stem, the stem having a substantially cylindrical
32 third body with a third bore therethrough, a third
33 screw thread on an outer surface thereof for

1 engagement to the second screw thread, and a polished
2 end distal to the screw thread. Once the running tool
3 is decoupled from the setting sleeve, the stem can be
4 connected to the setting sleeve to provide a polished
5 bore receptacle to the setting sleeve for tie-back
6 purposes.

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8 20.A method of setting a liner in a well bore, the
9 method comprising the steps;

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11 (a) providing a drilling liner system according to any
12 one of Claims 12 to 19;
13 (b) connecting the running tool and setting sleeve by
14 engaging the screw threads until the first and
15 second straight portions meet;
16 (c) connecting the running tool to a drill string and
17 the setting sleeve to a liner;
18 (d) transmitting torque to the liner by rotating the
19 drill string in a first direction;
20 (e) cementing the liner in place by introducing cement
21 slurry axially into the bore, to allow the slurry to
22 exit the liner and locate between the liner and the
23 well bore; and
24 (f) rotating the drill string in a reverse direction
25 until the screw threads disengage; and
26 (g) removing the running tool from the well bore.

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28 21.A method of setting a liner in a well bore as claimed
29 in Claim 20 wherein the first direction is right hand
30 rotation.

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32 22.A method of setting a liner in a well bore as claimed

1 in Claim 20 or Claim 21 wherein the method includes
2 the step of removing an assembly from the well bore
3 through the liner when the system is connected to the
4 liner.

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6 23. A method of setting a liner in a well bore as claimed
7 in Claim 20 or Claim 21 wherein the method includes
8 the step of shearing the shearing means when the drill
9 string is rotated in the reverse direction.

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11 24. A method of setting a liner in a well bore as claimed
12 in any one of Claims 20 to 23 wherein the method
13 includes the step of aligning the radial ports to
14 expel fluid from the system.

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16 25. A method of setting a liner in a well bore as claimed
17 in any one of Claims 20 to 24 wherein the method
18 includes the step of rotating and reciprocating the
19 system on the drill string during cementing.

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21 26. A method of setting a liner in a well bore as claimed
22 in any one of Claims 20 to 25 wherein the method
23 includes the steps of:
24 (a) following rotation in the first direction, noting a
25 first circulation pressure in the well bore;
26 (b) applying liner weight to bottom of well and partly
27 releasing the running tool from the setting sleeve
28 to shear the shear screws and align the radial
29 ports;
30 (c) confirming that circulation pressure has dropped
31 from the first circulation pressure;
32 (d) on pressure loss rotating the drill string until the
33 straight portions meet; and

- 1 (e) confirming circulation pressure has returned to
2 first circulation pressure.
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